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West Europe Report

SCIENCE AND TECHNOLOGY

No. 45

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WEST EUROPE REPORT

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ENERGY

PROGRESS, GOALS OF ALTERNATE ENERGY DEVELOPMENT

Paris SCOOP ENERGIE in French 15 Sep 80 p 9

[Article] "New Energies Have Moved Into an Operational Phase"]

[Text] At the Cabinet meeting held 30 July 1980 A. Giraud, minister for industry, has reviewed the status of the new energies, 2 years after the creation of COMES.

1. 1990 Targets: it is set at 5 percent of national energy consumption, which represent approximatively 10 to 12 Mtep, split between: geothermal 0.8 to 1.0, biomass 7.5 to 9.0, small hydroelectric power plants 0.4 to 0.5 and solar energy 1.3 to 1.5.

2. COMES Strengthening: Guy Lefrancois will be named General Director, attached to President Henry Durand. Two committees have been formed; "Biomass Energy" and "Solar Energy in Dwellings". Local authorities and Regional Public Establishments will provide support to COMES.

3. Resources: National programs will be expanded in 1981 (from 885 million francs for "solar energy, including biomass" and 224 million francs for "geothermal energy" in 1980). A 50 percent increased budget for COMES (140 million francs in 1980) will be introduced in the National Assembly.

4. Progress Reports: a) Solar hot water: currently 20,000 heaters are in use; orders hoped for in 1980: 40,000 units. Targeted annual production for 1990: 600,000 units.
b) Solar housing: programs initiated by COMES and Environmental and Quality of Life Ministry should result in the production of 30,000 solar houses per year, from 1985 on. Various ministries have already conducted experimental projects.
c) Solar electricity: project THEMIS (see SCOOP of June 1979, July 1979 and June 1980) and project VIGNOLA (see SCOOP December 1979) in Corsica are on schedule. This is also true of photovoltaic and captors development.
d) Geothermal: a dozen drillings have resulted in supplying 30,000 dwellings. Future planned rate of development is set at 20 to 25 drillings per year (750 million francs per year).
Note: last July, the Coulommiers drilling (destined to supply 1,000 dwellings ar hospital, three school complexes) reached the Dogger aquifer at a depth of 2,000 meters. Water surged out at 80 °C; pumping rate is 200 m^3/h.

e) Biomass: 20 experimental projects are currently in progress, with a 8.3 million francs support from COMES, toward combustion of dry materials (wood, straw) and manure fermentation.
Research program to convert biomass into methanol, preferably to ethanol: Post Office Administration and French Electric [Power] Company are conducting two pilot studies with a fuel containing 10 to 15 percent of methanol. Firewood share of total should increase from 3 Mtep in 1979 to 4.5 in 1980, and almost 6 in 1990, thanks to increased mechanical exploitation of forests.
f) In Overseas Departments and Territories: A development program of their energy supplies will be finalized before the end of 1980. It should include an inventory of resources; a follow-up study of current developments and past achievements, experiments with new technologies to produce electricity for use in active and passive air conditioning, or to produce hot water: either for collective use, by wind generators, gas generators, wood, sugar cane or coconuts wastes, small hydroelectric power plants; or conceived for public or collective installations in isolated locations, using photovoltaic or wind generators.

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CSO: 3102

ENERGY

BATTERY PRODUCES ELECTRICITY DIRECTLY FROM ALUMINUM

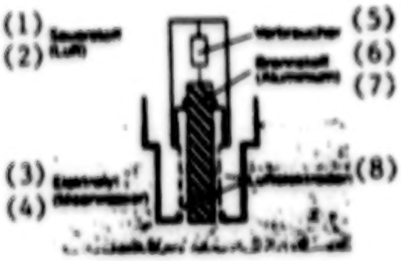
Heidelberg ELEKTRISCHE ENERGIE-TECHNIK in German Oct 80 p 290

[Article, "Aluminum--the New Light Energy Source"]

[Text] For several years Prof Dr Wolf Vielstich has been working at Bonn University's Institute for Physical Chemistry to make the chemical energy contained in aluminum directly useable as electrical energy. The first impressive result can now be recorded. It relates to producing electricity by electrochemical transformation of aluminum into aluminum hydroxide. Oxygen from the air, sea water, aluminum as fuel and thin air electrodes are constituents of the "open cell." The initial practical application is most logical where the aluminum-air cell in open form can be immersed directly in sea water to produce energy. Examples are aluminum sea water air batteries for marker lights for ships lying at anchor and for buoys or for emergency electrical supply for drilling platforms and life boats. Apart from use at sea, the light, transportable battery has unlimited shelf life and can be activated at any time by adding salt water.

Aluminum-air batteries with energy densities up to 300 Wh/kg (without salt water up to 2000 Wh/kg) can be made and thus represent an alternative to the fuel cells favored to date in research. American scientists even see the possibility of building electric automobiles which are comparable to conventional automobiles in speed and acceleration. A 30-kW vehicle will be built which will go to 1,500 km on 50 kg of aluminum.

[Diagram on following page]



Principle of "Open Cell" Air Element
Floating in Electrolyte

KEY:

1. Oxygen
2. Air
3. Electrolyte
4. Sea Water
5. Load
6. Fuel
7. Aluminum
8. Air Electrodes

9160
CSO: 3102

1981 BUDGET PROPOSALS ISSUED FOR COAL CONVERSION PROGRAM

Frankfurt/Main FRANKFURTER ALLGEMEINE in German 22 Dec 80 p 11

[Article: "German Coal Refining Begins in the Face of Obstacles"]

[Text] K.B. Bonn, 21 Dec--In the coming year the Federal Government will make available about DM 180 million for coal liquefaction and gasification installations. Now, for the first time, line items for the development of coal refining are included in the budgets of the Ministry for Research and Ministry for Economics. In the budget proposal of the Ministry for Research, DM 153.8 million is scheduled for 1981; DM 483 million is estimated through 1983. The Ministry for Economics is starting with an allotment of about DM 25 million for coal refining. To the extent it can be learned, a commitment on the order of DM 800 million will be authorized for the coming 4 years.

Within the coal refining program of the Federal Government, the Ministry for Research will concentrate on advancing the technology for producing oil and gasoline from coal. The Ministry for Economics will on the other hand financially support the introduction of coal gasification. The processes for the gasification of coal, especially brown coal, are rapidly approaching economic feasibility as the price of oil climbs. In the spring, the Federal Government will decide which coal gasification projects can be supported with Federal money. Concerning coal liquefaction projects, Bonn will make its decisions in the second half of the new year. Industry has proposed 14 projects which have been under study for several months.

With the budget line items for coal refining, the Federal Government will reveal its readiness to support the type of all-out effort between government and industry required to realize the production of gas and fuel from coal. However, it is no secret in responsible chambers that the financial leeway even for the important energy policy assignment has become tighter. Minister of Research von Buelow fears that not much will be left over for domestic liquefaction projects when additional funds necessitated by rapidly escalating costs are provided for the joint German-American project in Virginia (FAZ of 19 December)

In starting coal refining there are, in addition to financial difficulties, also more and more environmental policy restrictions. Minister of Economics Lambsdorff is bothered by the fact that an international oil firm is building--without goverment subsidy--a billion-DM gasification installation for coal refining in Rotterdam instead of on the German coast. The concern gives as reasons not only the advantages of various Dutch locations but also that the authorization process would be expected to take longer in the FRG than in Holland.

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CSO: 3102

ENERGY

OUTLOOK GOOD FOR COAL GASIFICATION USING VARIANT PROCESS

Duesseldorf BWK: BRENNSTOFF-WAERME-KRAFT in German Oct 80 pp 468-471

[Article by B. Cornils, J. Hibbel and P. Ruprecht, Oberhausen-Holten, and J. Langhoff and R. Duerrfeld, Bottrop: "Raw Materials and Energy Through Coal Gasification: The Ruhrchemie/Ruhrkohle Demonstration Plant for Texaco Coal Gasification"]

> [Excerpts] Since January 1978, Texaco coal gasification according to the Ruhrkohle/Ruhrchemie variant process has produced during experimental operation about 52 million cubic meters of synthesis gas from approximately 30,000 metric tons of coal. The synthesis gas has a composition of 54 percent CO, 34 percent H_2, 11 percent CO_2, 0.3 percent H_2S/COS, 0.6 percent N_2 and less than 0.1 percent CH_4. Thus, raw materials and energy through coal gasification are now also available by means of "second generation" processes, which are characterized by gasification of coal at high temperatures and high pressures and the use of dust coal of all qualities in the form of a slurry.

Introduction

The challenge "Energy through coal gasification--today!" sums up in one sentence the problems of energy and raw materials supply as well as an important possibility of solution: Synthesis gas, a mixture of carbon monoxide and hydrogen, made available through coal gasification, can be used as a versatile base material

--in the chemical industry for production of organic chemicals,

--in power plants for electric current and heating steam production,

--in the petroleum industry for production of motor fuels,

--in the thermal industry for production of synthetic natural gas and heating gas, as well as

--in the iron and steel industry for the direct reduction of iron ores.

Thus, synthesis gas is a chemical raw material as well as an energy carrier. This, together with its ready availability from oil or coal and its existing supply systems (long-distance pipeline infrastructures, etc.), make it an especially suitable connecting link between coal and oil. "Energy and coal gasification--today!" therefore means: Either the adaptation of presently available processes for coal gasification (which in some cases have long years of experience behind them, to present-day requirements and to standards now in effect, or--better--the development of modern coal gasification processes in which the requirements of modern reaction control and process technology as well as economic viewpoints are taken into account in the design stage--and thus determine the entire process. Under this heading come:

--Gasification at high reaction temperatures, whereby: elevated gasification conversations are attained, the gas is obtained free of byproducts which must be processed or removed (tars, phenols, methane), the handling of coal ash is decidedly simplified because of its liquefaction, and wastewater problems are avoided because of the reactions of cracking products. The temperature levels to be reached are over 1,000° C for brown coal and over 1,300° C for hard coal.

--Conversion at high pressures assures high specific capacities for the gasification plant and the following scrubbing installations, and reduces investment costs and compression costs during the further processing of the synthesis gas--whether through subsequent chemical syntheses or during utilization of energy, e.g., through "combined cycles." Depending on the use of the gas produced, the design is for pressures of 20 to 100 bars.

--The possibility of using finely divided, pulverized coal makes the gasification reaction suitable for all carbonaceous raw materials; this is true independent of their quality (carbon content, caking tendency, ash content, etc). The use of fine-grained coal also fits in with the trend of modern coal mining, which is directed, everywhere and always, toward automatized, mechanized mining of coal, with a high proportion of fine coal in the total output. Starting with sized raw material, it is always possible to obtain fine coal by grinding and thus produce a homogeneous charge. Fine coal, moreover, has a high specific surface area which is particularly suited to gasification.

--Suspension of fine coal in suitable liquids makes problem-free transport possible. Water is usable as a slurry liquid, and thus "run of mine" [in English] coal with bed moisture can be used without further pretreatment--in particular, without special drying or even drying combined with grinding, which are high in energy consumption.

As a slurry liquid, however, it is also possible to use liquid organic residuums from chemical production or from coal hydrogenation installations. This extends the area of application of coal gasification to include waste removal. Slurries of fine coal in liquids can be transported without complication and can be handled without the expensive safety measures required for dry dust coal. For slurries, moreover, conditions are suitable for easy process automatization.

The Texaco Process of Coal Gasification

The Process Principle

According to the present state of technology, only the principle of coal gasification as developed on a laboratory scale by the Texaco Development Company can gasify fine coal slurried in liquids at high pressures and high temperatures. According to this process, a coal-in-water slurry is atomized with oxygen and is gasified in co-current flow [entrained flow] downward in a flue dust cloud. The conversion proceeds autothermally, i.e., by means of combustion of a part of the coal charged, at temperatures in the neighborhood of 1500° C and at high pressures.

The advantages of the Texaco process principle have been recognized for some time and were the reason why the Ruhrchemie AG/Ruhrkohle AG study group started in 1975 to translate the principle onto a technological scale with a 6 metric ton per hour demonstration plant. Following a planning phase from 1975 to 1977, and a construction period lasting three-fourths of a year, the plant was put into operation in January 1978. Results of the experimental work done to date are reported here.*

Operating Experience

To date, in the large-scale demonstration plant approximately 30,000 metric tons of coal have been converted to about 52 million cubic meters (standard conditions) of "coal gas" in about 6,000 hours of operation. Up to now, five different types of coal have been gasified; Table 2 gives their properties (see also Figure 3). It was possible to convert all of these coals with good yields and without processing difficulties.

Table 2. Data for Coals Used Up to Now

Tabelle 2: Kenndaten bisher eingesetzter Kohlen

Typ (1)	Eßkohle (4)	Fettkohle (5	Gasfl.-Kohle (6)	Gaskohle (6	Kohleschlamm (7)
Nummer (2)	1	2	3	4	5
Bergwerk (3)	Friedr. Heinrich	Friedr. Heinrich	Lohberg	Osterfeld	Prosper
Zusammensetzung (8) (% waf)					
C	85.4	81.9	80.8	79,4	60,0
H	4.0	4.7	5.0	4.9	3.8
N	1.6	1.5	1.5	1.6	1.1
S	0.8	1.1	1.1	1.0	1.4
O	2.6	4.0	5.1	4.6	3.8
Asche (9)	5.6	6.8	6.5	8.5	27.9
Flüchtige Bestandteile (10)	16.0	21.7	32.1	[illegible]	24.2
Wassergehalt (%) (11)	rd 8 (13)	rd 8	rd 8	rd 10	40 bis 55 (14)
Korngröße (12)	100% < 10 mm	100% < 10 mm	rd 8% > 10 mm	100% < 10 mm	7 bis 35% > 315 µm

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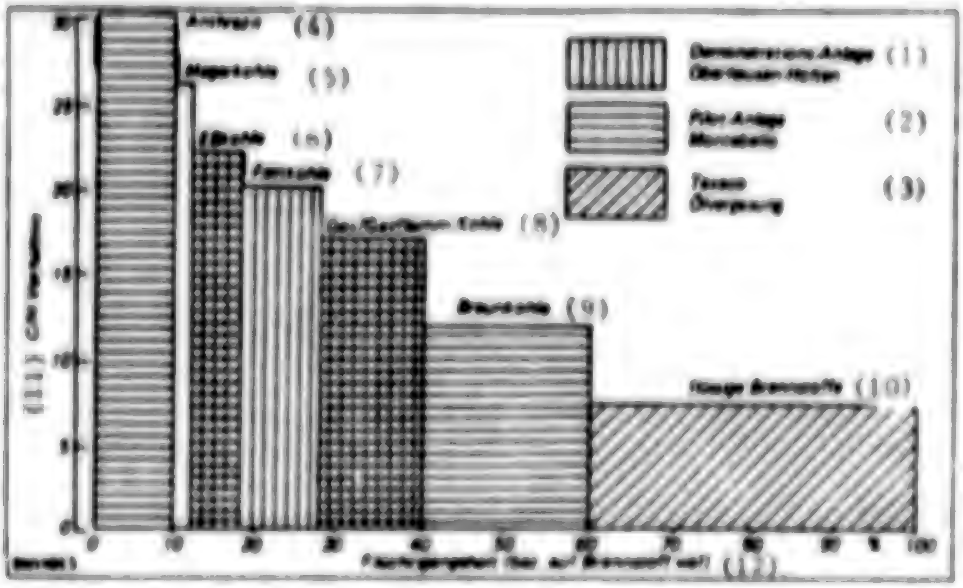
*The work on which this report is based was supported by financial means of the federal minister for research and technology (support project No ET 1217 Z), for which we express thanks here.

Key:

1. Type
2. Number
3. Mine
4. Forge coal [low-volatile hard coal]
5. Fat coal [medium-volatile hard coal]
6. Gas coal [high-volatile hard coal]
7. Coal mud
8. Composition (% water-free)
9. Ash
10. Volatile constituents
11. Water content in %
12. Grain size
13. Approximately 8
14. 40 to 55

Figure 3. Coals Used in Texaco Coal Gasification



Key:

1. Oberhausen-Holten Demonstration Plant
2. Montebello Pilot Plant
3. Texaco oil gasification
4. Anthracite
5. Lean coal [semi-anthracite]
6. Forge coal [low-volatile hard coal]
7. Fat coal [medium-volatile hard coal]
8. Gas coal & open-burning coal [high-volatile hard coal]
9. Brown coal
10. Liquid fuels
11. C/H ratio
12. Volatile content (referred to fuel, water and ash free)

As shown in Figure 3, the demonstration plant has up to now gasified forge coal, fat coal and gas coal with volatile contents from 16 percent to 32 percent. The use of coal sludge (from the coal scrubbing) shows that the process is suited for gasification of moist substrates of high ash content.

With these coals, the area of interest for Ruhr district coals is covered. As Figure 3 shows, at the Texaco Development Company's pilot plant in Montebello, California, anthracitic and semi-anthracitic coals have been gasified on a small scale to date, and brown coal can also be slurried and gasified. The area of "liquid fuels" includes, for practically ash-free grades, heavy heating oil and thus the Texaco oil gasification process. For materials of high ash content, both the residuums of coal hydrogenation and coals slurried in the liquid residuums of other products are understood. These, because of the necessary ash removal, require the special technology of coal gasification.

Directions of major effort in the test operation since the plant was officially opened in April 1978 have been:

--the startup,

--the working out of process technology problems arising from particular properties of the coal--as compared with heavy heating oil as the charge stock in oil gasification--and which included the problems of slurry production and transportation, gas cooling, materials selection, measurement and control technology, testing of components, and process [heat and material] balances,

--the testing of different types of coal,

--optimization of the process,

--determination of data of environmental concern.

The plant's operational characteristics result from the problem-free transportation of the coal/water slurry and thus resemble those of heavy oil gasification. The plant is distinguished by a markedly quiet and continuous type of operation and can be started, controlled and adjusted over a wide range of capacities without difficulty. Fundamental mechanical, control- or safety-technology problems do not exist. Questions with regard to the long-time creep strength of the materials to be used can be answered positively throughout. For definitive statements, however, longer test periods should be awaited.

An overview of the experimental results obtained to date is given in Table 1 [not reproduced]. The plant was operated at reactor pressures between 18 and 35 bars and reactor temperatures of 1350 to 1500° C, between 20 and 130 percent of design capacity. During this operation, 1.4 to 6.9 metric tons per hour of coal were converted to 2,000 - 13,000 cubic meters per hour of pure gas. The slurry concentrations run to date were between 45 and 70%, with the latter figure characterizing the favored mode of operation. A further increase of the slurry concentration is possible and will--among other things--be at the center of further experimental work.

Two different grinding processes are available today for production of the slurry. More than 1 year of development work was done on the first concept. Wear problems at the grinding tools which arose initially with this mill can be considered as solved through the use of suitable materials. The advantage of this type of mill lies chiefly in low investment costs, in particular for plants of limited size. The limited grinding fineness makes this mill appear to be suited primarily for the more easily gasifiable coals. This type of mill is relatively sensitive to impurities in the coal used.

One year ago the operation was changed over to another type of mill which fully came up to expectations in relation to grinding fineness, flexibility of the grind, throughput and operational safety. Its advantage lies particularly in the high degree of grinding fineness, its lack of sensitivity to foreign substances, its easy operability, and the fact that with this mill a unit proved for coal grinding up to the highest capacities is available.

Particular weight was assigned to the testing of the reactor brick lining. The combined attack of the highly reducing atmosphere at high temperature and the presence of liquid slag and abrasive solid materials require the refractory material to withstand severe service. To solve this problem, several test surfaces made up of refractories of different composition and origin were built into the reactor brickwork. Their very different behavior, in some cases, has led to the selection of a grade of refractory brick from which acceptable operating periods are expected.

Reactor temperature measurement has proved to be a special measurement technology problem. Because of the destruction by slag of the ceramic protective wells of the thermocouple elements used, and because of damage to the platinum-rhodium thermocouple wires by hydrogen, longer operational test periods could not be achieved initially due to the short life of the thermocouple elements. It has been possible to eliminate this problem since then by selecting suitable materials and by a different arrangement of the measurement probes. Moreover, alternate measurement methods are being tested successfully.

The principle of two-step gas cooling chosen has proved correct. The first step, the radiation cooler, accomplishes its assigned function of cooling the gas to solidify the liquid slag and to a large degree separate the ash. Fouling of the cooling surfaces occurs to only a limited degree and can moreover be largely avoided through suitable in situ cleaning methods. The fouling by small amounts of solidified ash fines observed at times in the subsequent convection cooler was brought under control by a modified design.

The discharge system for removal of slag from the pressure vessel no longer presents any problems. Difficulties occurring initially as a result of unexpectedly low-bulk density of the slag, which resulted in a low downward velocity in the water phase and very high-transport volumes, were eliminated by design modifications. Electronic control of the sluice system since then has worked without problems and without any manual intervention. No fundamental erosion problems in the discharge components have occurred.

Unlike the recycled water which is returned to the gasification, the carbon unconverted in the test installation has not as yet been returned to the gasification. The indicated conversions and efficiencies therefore hold in all cases for single-pass flow through the gasifier. For operation in a recirculating mode, they are to be recalculated upward correspondingly. Comprehensive analytical investigations were conducted to assess the wastewater quality. Some of the data are summarized in Table 3.

Table 3. Data for Wastewater Quality (Values for coals from the Ruhr)

pH value		7
Hardness	°dH*	5
p value [phenolphthalein]	mval/l**	0
m value [methyl orange]	mval/l	9
Electroconductivity	μS/cm***	3000
Residue from vaporization	mg/l	600
Total sulfur	mg/l	90
Chlorine	mg/l	500
$NH_3 + NH_4^+$ ions	mg/l	400
CN-	mg/l	5
CSB value [chemical oxygen demand]	mg O_2/l	60
$KMnO_4$ consumption	mg/l	90
Arsenic	mg/l	0.1
Cadmium	mg/l	< 0.002
Nickel	mg/l	0.2
Phosphorous	mg/l	0.03

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* German degrees of hardness (1 part CaO per 100,000 parts water)

** milli equivalents per liter

*** micro conductivity units or microsigmas per liter

The values in Table 3 hold without recirculation of the wash water to slurry preparation. Effects of water recycle, as well as variation of the quantity of water purged, are under investigation at this time.

The data on wastewater quality show that, because of the high reaction temperatures, the wastewater is absolutely free of organic compounds (higher hydrocarbons, phenols and the like). It contains, in addition to sulfides, ammonia, chlorides and very small proportions of cyanide, only a few trace elements, which are necessarily introduced into the system by the coal. The quality of the wastewater is thus better than that of many chemical processes. The ash is fully suitable for storage [on the ground]. For removal of sulfur compounds (H_2S and COS)--in particular, if the synthesis gas is to be further processed by chemical syntheses --the coal gasification is usually followed by an acid gas wash. This then contributes very considerably toward a reduction in environmental pollution by SO_2 when parts of the sulfur-free coal gas are used for the production of energy, whether as a high BTU fuel gas or after conversion to SNG [synthetic natural gas].

Since the beginning of February 1980--corresponding to the capacity of available compressors--parts of the coal gas from the Texaco coal gasification in the Ruhrchemie/Ruhrkohle technological variant process have been fed into the synthesis gas grid of Ruhrchemie AG and via oxosynthesis are used for the production of organic chemicals--butyraldehyde, butanol, 2-ethyl-hexanol, 2-ethylhexanoic acid, amyl alcohols, DOP (bis (2-3thylhexyl) phthalate) and others.

Prospects

Operating results of the Oberhausen plant to date have proved the operability of Texaco coal gasification in the Ruhrchemie/Ruhrkohle variant process. Some of the test results obtained are clearly better than the design figures and lead to expectations of a future for the process not only in the chemical industry but also in many other branches of industry--the energy industry, the steel industry, the production of motor fuels and others. The major directions of further experimental work will be:

1. Testing of alternate solutions for reactor design and waste heat utilization,

2. Further increase of the cold gas efficiency through optimization of process parameters and recycle of unconverted carbon,

3. Increase of the thermal efficiency through improvement of thermal integration,

4. Testing of the transformation of synthesis gas into hydrogen (through shift-gas conversion) as well as into SNG (through methanation),

5. The use of coals and carbonaceous residuums from different sources,

6. The testing of other slurry media than water,

7. The proving out of components durability.

The fact that today synthesis gas from coal is only 25 percent more expensive than synthesis gas from heavy oil gives particular importance to the site where the coal gasification process of the "second generation" was first achieved: synthesis gas from coal is today already competitive if coal prices of approximately DM 100 per metric ton can be obtained. This is the case for so many sites in the world that planning and construction work to build units for 80,000 to 100,000 cubic meters (standard conditions) of synthesis gas per hour have already been carried out in the United States (final products ammonia, methanol and acetic acid).

Since the FRG Government has indicated that it wishes to further and support commercial coal conversion plants in the FRG as well, initial planning considerations for a plant of this size for the Oberhausen-Holten site have begun. The possibility of using the synthesis gas for chemical and energy production there should be given considerable weight, in addition to the opportunity to use an up-to-date and at the same time simple process which in many respects leaves the existing variant processes for coal gasification behind.

5586
CSO: 3102

FIRST MID-CITY GEOTHERMAL BOREHOLE SUNK

Paris AFP SCIENCES in French 6 Nov 80 p 39

[Text] Bordeaux--The first mid-city geothermal borehole in Europe was started 3 November in Meriadeck, a district in the full process of renovation in the center of Bordeaux, by the city's mayor, Mr Jacques Chaban-Delmas.

Drilling is scheduled to continue over a period of 3 months to reach a depth of 1,100 meters. Based on an output of 150 cubic meters per hour of water at a well-head temperature of 45 degrees, it will be possible to heat 60,000 square meters of office space and 17,400 square meters of living quarters, some of which will be equipped for it starting at the end of 1981. The use of this thermal energy will save 7,573 megawatt hours of electricity, or the equivalent of 1,590 tons of oil, yearly.

The Ministry of Industry decided on 22 April to subsidize this operation to the extent of 4.4 million francs and to accord it a national priority status. The EEC, for its part, has granted an aid of 2.14 million French francs to the project, half of which is a nonreimbursable subsidy, owing to its "highly demonstrative" nature.

Protection of the quality of life of the residents adjacent to the project has not been neglected, and highly sophisticated techniques will be used. An anti-noise wall --the first of its kind in an urban environment--has been built to limit as much as possible the noises emanating from the drilling operation, which will proceed night and day.

The closest residents are not less than 170 meters away in this district, where many decrepit buildings have been demolished. New buildings already constructed include many office buildings, among which are those of the new prefecture.

In addition, diesel engines have been replaced by electric motors, which are quieter, and the entire substructure has been built as close as possible to the ground. The noisier operations will be programed by day to the extent feasible.

9399
CSO: 3102

ENERGY

NONPETROLEUM FUELS PROGRAM BEING SET UP

Paris AFP SCIENCES in French Nov 80 p 51

[Text] Paris--The Ministry of Industry is conducting studies on a project to produce a fuel--"carburol"--based in part on the use of agricultural products, according to informed sources in Paris.

The setting up of a nonpetroleum-fuels program was one of the 29 priority actions assigned to the government by the president of the French Republic, to be completed by the end of his septennate.

This "carburol" (a neologism combining the terms "carburant" and "alcohol") project is to be submitted to the Council of Ministers as soon as the studies are sufficiently well along, probably by the end of the year. To be viable and credible, such a program must be able to produce in time at least 10 percent of our national fuel needs, which currently total 17.6 million tons (+9.5 million tons of diesel oil) in an overall total French consumption of 100 million tons of oil a year.

It will be essential to choose a plant that can be grown in sufficient quantities on the national territory and that can be distilled at the lowest energy cost possible. No more energy must be put into the process between the collection and the distillation of the agricultural product or products to be used than is represented by the substitute fuel obtained.

It is generally estimated that the operation will be viable if it does not cost any more from the energy standpoint than the product's equivalent in coal. Beets and corn (whose alcohols are well known) are evidently high on the list. But preference seems to be leaning currently toward the Jerusalem artichoke, whose involucre has an appreciable energy content.

Although running on Jerusalem artichoke alcohol may seem Utopian in France today, filling automobile gas tanks with sugar cane alcohol is already a reality in Brazil. In 1980, some 3.8 million tons of alcohol were produced and mixed in the proportion of 20 percent alcohol to 80 percent gasoline. The objective is to approach 11 million tons by 1985. And since 1980, 200,000 of the 1 million automobiles produced in Brazil have been equipped to run on alcohol.

Other Latin American countries are preparing to follow Brazil's example, while the Japanese government, according to the publication "Scientific and Technical News of Japan," has just signed a biomass development contract with 17 enterprises. In this case, alcohol is to be produced from rice straw and husks, which are currently not used and which would provide the equivalent of 20 percent of Japan's gasoline consumption requirements.

9399
CSO: 3102

BRIEFS

COPPER CONVERTS LIGHT INTO HEAT--An Italian businessman abroad, an engineer, Pedone, will soon market a copper sheathing device which, when mounted on windows as shutters or blinds, is capable of heating a house even on cloudy days. "Following years of study, we invented what I label as the answer to high cost oil," said Pedone, president of Coppertron S/A, headquartered on Tournai (Belgium). According to Pedone, the hypersensitive copper sheathing has the ability of giving off heat by means of a chemical phenomenon: it can easily heat a medium-sized room. The sheet is very sensitive to light and thus functions even when the sun is not present. The sheathing will be sold in rolls 1.4 meters wide and will begin to be marketed in a few months: it will cost 900 francs (26,500 lire) per square meter. According to test runs at the University of Valencienne, the product is capable of "producing much higher temperatures than other well known solar energy collectors." The university describes the results as "remarkable." For example, they discovered that on cloudy days, with temperatures at 6 degrees, a square meter of copper sheathing can bring the temperature in a 40 square meter room up to 18.3 degrees in 1 hour. The sheathing is capable of converting 84 percent of the light it absorbs into heat on a sunless day. If then the sun is present and it is hot, the heat produced by the sheath increases threefold. Pedone stated that if used as a blind, the inside temperature can be changed by adjusting the position of the blind itself. The sheathing has one side which absorbs light and another side which gives off heat. [Text] [Rome RASSEGNA PETROLIFERA in Italian 28 Nov 80 p 1032] 9209

SOLAR-POWERED DESALINIZATION PLANT--The first Italian desalinization plant to run on solar energy began functioning during the past few days near Crotone. The plant was manufactured by AGIP's [National Italian Oil Company] FORI (Renewable Resources and Energy Conservation) branch. The plant allows for the extraction and desalinization of salt water using the sun as a source for photovoltaic conversion. The wells and desalinization plants are located in the immediate vicinity of the Crotone gas dehydration plant and use the inverse osmosis desalinization process. The daily water output amounts to about 5,000 liters. It is earmarked for the drinking water supply of the Crotone dehydration plant. Power for the extraction pump is furnished by a photovoltaic system whose maximum output is 3 kilowatts (when the solar energy intake is at its maximum) for a daily peak (extraction) capacity of 30,000 liters. [Text] [Rome RASSEGNA PETROLIFERA in Italian 31 Oct 80 p 936] 9209

HISPANO-PORTUGUESE SOLAR PLANT--Lisbon--Portugal and Spain will build a solar plant on the border between the two countries in 1981, it was learned from the Portuguese Secretariat of State for Energy. The project, which is expected to produce around 20 megawatts yearly, will include participation by the Federal Republic of Germany. [Text] [Paris AFP SCIENCES in French 6 Nov 80 p 37] 9399

COAL-GASIFICATION EXPERIMENTS--1. French Gasification Developments: a) At Bruay-in-Artois [Northern France] insitu firing has been successfully conducted. A similar experiment will probably be conducted in Lorraine. b) A surface prototype, which would lead to a semi-industrial installation is planned at Gonfreville on the Total company property. c) A study group for liquid phase coal hydrogenation and hydrogasification of reaction products has been formed by French Gas Company (43 percent), French Coal Mines (26 percent), French Petroleum Institute (17 percent), and National Center for Scientific Research (13 percent). [Excerpt] [Paris SCOOP ENERGIE in French 15 Sept 80 p 8] 9627

CSO: 3102

INDUSTRIAL TECHNOLOGY

LARGEST USER OF ELECTROEROSION COMMENTS ON TECHNIQUE

Paris INDUSTRIES & TECHNIQUES in French 31 Oct 80 p 11

[Article by Andre Larane: "Andre Heintz: 'Erosion Remains Unknown'"]

> [Text] Research centers are unaware of the resources of electroerosion. Andre Heintz believes in it, however. Head of the first subcontract shop in France, he did not mind breaking new ground. He is probably the most experienced user.

Unusual in France, this forest of 18 electroerosion machines and eight computer-operated wire machines [machines a fil a commande numerique] at the Outil-Precis Company in Saint-Ouen. Its director, Andre Heintz, has more or less accidentally become France's pioneer and specialist in erosion. He was a tool factory foreman up to 1960, and there was nothing to suggest his turn toward unconventional manufacturing. When he opened his own business, it was to design and build automated machines with two co-workers. His orders were for machines to pack cartridges, to scour saucepans or to sew seatcovers for Simca. Management was difficult. "I'm a technician, not a businessman," asserts Heintz to justify the direction he finally took. "In making prototypes, the final finishing process sometimes costs more than the construction. Clients have a hard time understanding this and are reluctant to pay for it."

While working, he followed from one exposition to the next the development of electroerosion, a technique created in about 1955 and which immediately interested him. But the first machines were not very successful, with the rate of wear on the electrode of over 100 percent in relation to the amount of metal removed. In 1967 the technique took a leap forward with the appearance of a transistor-operated generator for impulse electroerosion. The copper in the electrodes was replaced by graphite. This was enough for Heintz, who gave up automation for good and bought two machines. The first user in France, he had to perfect the machining method, which the manufacturer was too inexperienced to be able to provide. It is not always fun to break new ground, and he has a few bad memories of that period. Nevertheless, the Outil-Precis team worked more calmly. The orders were small, reducing risks and making payments easier. In order to convince large companies of the benefits of subcontracting this jobber promise deliveries in amazing times, not even possible within a single large firm because of its administrative sluggishness. Heintz would take orders for next-day deliveries. He also guaranteed a high degree of productivity thanks to his complete gamut of machines.

Between 1967 and now, Outil-Precis has regularly been buying two additional machines a year. There are 28 people working for him, of whom 22 are production workers.

Wire erosion [erosion a fil] was born in 1969. But the first computer-operated machines took too long to program. It was not until 1973 that the first satisfactory post-processor appeared. Andre Heintz immediately bought a machine and its software. None of the practical programs take more than three hours to write. And Outil-Precis does 60 of them a month. Maximum precision is to 1/100 mm using wire erosion. To do even better, in 1978 Heintz gave in to a computer-operated contouring precision grinder with a tolerance of 1.5 microns. He was once again the first. With this machine he widened his horizons to finishing cams.

Today he has eight of the 120-150 computer-operated wire machines in France. Compared to Germany, which apparently has 450, the national industry is under-equipped. "The benefits of wire erosion failed to be recognized. All too often when research offices think of making dies, they think 'contouring.' And they're wrong." Using this method the part has to be made in several pieces in order to finish the inside. With wire erosion the die is in one piece. The process is perfect for making prototypes, dies or electrodes and for tempered material. Electroerosion is moving in the direction of a single electrode for the rough outlines and the final finishing, thanks to a decrease in the rate of wear and control of the electrode's planetary movements through the use of a computer.

Heintz is not worried about competition in this underdeveloped field. "There's room, plenty of room even, for other companies like mine. I can barely keep up with the demand. Unfortunately, the weight of the investments slows everything down." The expansion of Outil-Precis is slowed by financial factors. The erosion machines, all foreign made, cost a minimum of 1 million francs. Furthermore, the Saint-Ouen company's wire machines are kept in an expensive air-conditioned area. Because of lack of available funds or favorable loans, the equipment is leased and redeemable in 5 years. During this time, the banker is certainly the one who makes the largest profit from this work...Is this enough to explain the small number of new businesses using erosion?

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INDUSTRIAL TECHNOLOGY

BRIEFS

INDUSTRIAL ROBOT MARKET--The number of industrial robots in Europe should increase more than eightfold during the 1980's. At present, about 2,400 industrial robots are in use in Europe. A survey by the market research company Frost & Sullivan shows that there will be more than 20,000 in 1990. The units already installed are distributed as follows, by type of application: resistance welding, 20 percent; surface treatment, 20 percent; arc welding, 5 percent; other manufacturing processes, 5 percent; transport of materials, 50 percent. For more information, write to: Frost & Sullivan Ltd., 104-112 Marylebone Lane, London W1M 5FU, England. [Text] [Munich REGELUNGSTECHNISCHE PRAXIS in German Oct 80 p 388] 9294

CAD/CAM SYSTEM DEVELOPED--Ferranti Cetec Graphics Ltd., Edinburgh, has delivered the first computer-aided design and manufacturing (CAD/CAM) system to FSW Ltd. (Fletcher, Sutcliffe, Wild) in Horbury, West Yorkshire. According to the manufacturer, CAM-X is a modern computerized interactive graphic system incorporating the latest CAD/CAM technology in an extremely flexible and versatile modular architecture. CAM-X has been developed by Ferranti Cetec with the collaboration of leading UK construction and computer companies. British machinery manufacturers are extremely interested in this system because it has achieved all the main objectives assigned to CAD/CAM in previous years' reports.[Text] [Essen ELEKTRO-ANZEIGER in German No 21 (Nov) 80 p 8] 9294

NEW POWDER METALLURGY PROCESS--Next fall, the Swedish electrotechnical firm Asea will build a new plant near the Surahammars Bruk metallurgical plant; the new plant will use a new powder metallurgy process for the production of alloy steel blanks and semi-finished products for subsequent hot-forming. In this stamping process, the material is first comminuted in a stream of gas and the powder is then pressed into a homogeneous material. The gas comminution and the compaction are two entirely new parts of the process which have been developed by Asea in cooperation with Surahammar. Steel obtained by powder metallurgy is free from segregation and considerably more homogeneous than conventional ingot castings. Besides, the amount of material needed for the production of semi-products is considerably smaller. Further development will make the new process still more economical and will make it possible to produce profitably high and medium alloy steels, e.g. tool steels and high-grade stainless steels. [Text] [Frankfurt/Main ATOM + STROM in German Jul/Aug 80 p 128] 9294

CSO: 3102

BUDGET FOR MINISTRY OF INDUSTRY UP FOR 1981

Paris AFP SCIENCES in French 13 Nov 80 p 1

[Text] Paris--The Ministry of Industry's 1981 budget scheduled to be submitted to the National Assembly on 13 November totals 5 billion 931.605 million francs for program authorizations (+16.75 percent), and 13 billion 573.820 million francs for outpayments (+13.19 percent), of which, respectively, 4 billion 810.847 million francs and 7 billion 664.752 million francs come under the civil research budget.

This package contains 8 billion 481.105 million francs in disbursements for general expenses (3 billion 338.525 million for the civil research budget), an increase of 849.660 million francs (+11.13 percent). The capital expenditures budget contains 5 billion 931.605 million francs in program authorizations (4 billion 810.847 million for civil research), and 5 billion 92.715 million francs for disbursements (4 billion 326.227 million for civil research). This represents an increase of 16.75 percent in program authorizations and 16.78 percent for disbursements.

In the energy domain, allocations for the development of substitute energy sources are to be increased by 17 percent. Solar energy allocations are increased by 60 percent (to 199.3 million francs), and geothermal energy allocations will go from 44 to 60.2 million francs (+40 percent). Subsidies to the Atomic Energy Commission will increase by 13 percent and appropriations for energy savings by more than 25 percent to 661.8 million francs.

Allocations for the raw materials policy are substantially increased, totaling 590 million francs, an increase of 65 percent, owing principally to the intensification of the strategic stockpiling program, for which a budget allocation is being made for the first time (169 million francs).

Allocations for subsidies to the industrialization of new products and the adaptation of industrial structures have been maintained at the same level as in 1980. Appropriations for societal computerization are to increase almost 30 percent.

Allocations to the CNES [National Center for Space Studies] will total 1 billion 677.5 million francs, an increase of 22.5 percent, and those to the CNEXO [National Center for Exploitation of the Oceans] will total 304 million francs, up 27 percent.

Lastly, funds for the financing of the innovation policy will total 542.3 million francs, up 15 percent, and those for the product standardization and quality improvement programs will total 97 million francs (+ 11.5 percent). (AFP SCIENCES will analyze the different allocations in its forthcoming issue).

9399
CSO: 3102

GOVERNMENT PROMOTES FLEXIBLE WORKSHOPS

Paris LE MONDE in French 7 Dec 80 p 14

[Article by Eric Rohde: "The Turn of the 'Flexible Workshops'"]

[Excerpt] Technological changes brought about by the flexible workshop center on machine-tools. This is a sector where France is distinctly behind other developed countries. With production worth $580 million a year, France ranks last after Britain and far behind the Federal Republic of Germany (whose production in this sector totals $2.6 billion a year), the world leader. Perhaps even more serious is France's low rate of capital investments in its enterprises and the obsolescence of its inventory. The latter is estimated at 700,000 units of machine-tools of which only 8,000 have automated controls, that is, are guided by computerized programs. Yet, pieces of equipment with computer controls are not only 3 times more productive in themselves but it is with these that one can build an automated flexible workshop.

Twofold Risk

involved, then, is a twofold risk for French industry and especially for its small- and medium-sized enterprises: To miss a technological turn and become less competitive than that of competitor countries.

To offset the undercapitalization of the firms witnessed for the past 5 years by great timidity in investment, the government authorities have set up the Meca system. Small- and medium-sized industries wishing to become equipped with computer-controlled units can find under this procedure assistance ranging from 4 to 25 percent of the cost. Some 18 million French francs in all will thus have been distributed in 1980. Furthermore, the Ministry of Industry initiated a consultation program at the start of 1980 in order to promote flexible workshop pilot projects. Among the 10 proposals retained out of the 26 applications received three, including one at Renault, will certainly see fruition, the others being the subject of negotiations. Public participation involves only half of the share imputable to the "flexible concept" proper, which itself represents about 40 percent of the overall cost. The total budget of the operation, which figures as one of the priority actions of CODIS [Guidance Committee for the Development of Strategic Industries], is 300 million francs. The proposals submitted undoubtedly originate from large firms such as the CGE [General Electric Company], Matra, Peugeot, Talbot, and others.

The principle of such action can certainly help make evident French engineering and logistics in the field of flexible workshops. One may nevertheless wonder about its scope.

Even though the challenge unquestionably consists in a major effort for the rationalization and redesigning of production tools in the field of medium-sized and small production lines which reportedly account for 40 percent of employment--problems to which the coined term "productic" is already applied by some observers--these measures would still not represent a solution but rather a supplement.

2662
CSO: 3102

REDUCED FUNDS MAY FORCE REARRANGEMENT OF R&D PRIORITIES

Bonn DIE WELT in German 19 Dec 80 p 11

[Article by Heinz Heck: "Von Buelow: German Industry To Close Financing Gap"]

> [Text] Bonn--The Federal Government will not decide until the end of January whether to withdraw from the German-American-Japanese coal liquefaction project in Morgantown, Virginia or seek another form of financing. Yesterday Minister for Research Andreas von Buelow confirmed WELT reports that he had proposed to the cabinet cancellation of the project due to a lack of funds.

Nevertheless, von Buelow is not closing the door on the option that the Federal Government "may stay with the project for reasons of energy and alliance policies." The minister for research, who was granted by the cabinet a budget of DM 6.1 billion for 1981, will have to get along with approximately DM 700 million less than was scheduled in existing medium-term financial planning.

Eliminating Germany's 25-percent participation in the $1.4 billion project in Virginia would reduce the expenditures for the next 8 years by approximately DM 630 million (according to current price levels); in 1981 alone, savings would amount to DM 65 million. According to von Buelow, it is also "feasible" that the German industry will play a greater part in the project than was originally anticipated to relieve the federal budget. To date 15 percent of the German share has been earmarked for the German industry.

Even with respect to advanced reactor lines (fast breeder and high temperature reactor), the minister wants to encourage industry to assume a larger share. In the meantime, he has been moving away from his earlier proposal of levying a "research tax" to raise the necessary funds in case the EVU [electric utility enterprises] should not be willing to assume 30 percent of the costs.

Beginning as early as 1981, he wants to collect from the EVU approximately DM 200 million annually for the construction of the two demonstration power plants.

Von Buelow admitted that budget cuts (until 1984, when compared to the current medium-term financial planning, a reduction of approximately DM 2 billion) would have caused a loss of between DM 200 and 300 million: Industrial enterprises have already stepped in to cover these obligations of the FRG Ministry for Research and Technology and it remains to be seen when the house itself will be able to take over. The minister wants to use the budget cuts as an opportunity to rearrange priorities also with regard to current projects. He is primarily considering the extension of current plans. On the other hand, he wants to completely eliminate as few projects as possible. Among these, in addition to the coal refining installation, are the Rheine-Freren railroad testing facility and the funicular railway in Hamburg.

Basic research, which in recent years has consumed 30 percent of the budget of the Federal Ministry for Research and Technology, is to remain the focal point. In the minister's opinion, "energy research in nuclear as well as nonnuclear areas is still the first priority to achieve "independence from oil." In addition to coal refining, the 1981 budget provides considerable increases in expenditures for research and development in nuclear waste disposal, microelectronics, biotechnology and polar research. Transportation technology, information processing and building research "must accept considerable cuts."

In 1978, the FRG was the international leader with regard to government support for research and development; expenditures totaled almost 2.3 percent of the gross national product. Von Buelow was concerned that "in the not too distant future it could slide to the middle position" in view of greater efforts by other countries, for instance, France.

In the opinion of the Bonn opposition, the new minister for research did not take advantage of the move toward economizing, failing to reduce the subsidy character of his budget. He lacks the courage to establish priorities, and, consequently, he is maintaining the large number of projects.

8991
CSO: 3102

SCIENCE POLICY

DEVELOPMENTAL AID TO MALAGASY TO INCREASE

Paris AFP SCIENCES in French 6 Nov 80 p 9

[Text] Antananarivo--The contribution to be made by the French Bank for Aid and Cooperation [FAC] to the development of Madagascar in 1981 will total around 150 million French francs (7.5 billion Malagasy francs), an unprecedented figure, said Mr Robert Galley, French minister of cooperation, at Antananarivo.

The head of the French delegation to the 3d meeting of the Joint French-Malagasy Commission issued this information at the conclusion of meeting held in Antananarivo 28-30 October.

Speaking solely of the FAC's non-reimbursable grants (150 million French francs in 1981, compared to 32.12 million in 1980), the French minister pointed out that the Joint Commission had decided in favor of an improvement in the effectiveness of French technical aid (close to 600 aid personnel currently in Madagascar), which henceforth will be more and more oriented toward the "training of trainers."

In addition to the above, however, Mr Galley stated that the Commission will devote a special effort to scientific research.

Specifically, the Commission is considering:

--continuation of efforts for the development of the cultivation of cotton and coffee, as well as agroindustrial studies;

--development of a pilot soybean-production unit;

--development of rice culture in the Alaotra lake region (northeast of Antananarivo), where a seed-production center will be created; the effort will extend over several years;

--study of the Soalala iron deposit (western littoral);

--construction of a microwave link between Fianarantsoa (center) and Tulear (southwest) going through Fort-Dauphin (southwest).

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CSO: 3102

SCIENCE POLICY

BRIEFS

RESEARCH BUDGET--The 1981 research budget has been approved by the French National Assembly. The latter passed on 22 October 1980 the research budget, the first budgetary component of the second part of the finance bill for 1981 earmarked to government expenditures. The 1981 research budget (see AFP-SCIENCES, No 229) is, according to the term of Pierre Aigrain, secretary of state to the prime minister in charge of research, a "catching up" budget to enable France to reach by 1985 the level of 2.2 percent of its Gross National Product for research and development outlays. However, Pierre Aigrain noted, the growth in government allocations for research which will enable France to reach the same level as the United States, Japan, and the Federal Republic of Germany depends on the evolution of private expenditures. The contribution of French firms to the research effort is indeed below that of other industrialized countries, the minister explained. Finally, he recalled that this budgetary allocation, up by 17.6 percent compared to 1980, includes sectors of rapid growth such as energy, data processing, oceanography, and raw materials, and that it will make it possible to add 410 more research positions. [Excerpt] [Paris AFP SCIENCES in French 23 Oct 80 p 1] 2662

HYDROGEN-PRODUCTION PROJECT--Bern--Switzerland will participate in an AIE [International Energy Agency] research project on the production of hydrogen as an energy source. The Swiss Federal Government decided on 12 November to participate in the work under this project on the catalytic photolysis of water (decomposition of water under the influence of light). The hydrogen this project seeks to produce by this process may very well be called upon, more or less in the long term, to play an important role as an energy source. As of now, one of the obstacles to more widespread use of hydrogen is the difficulty of producing it at a viable price. [Text] [Paris AFP SCIENCES in French 13 Nov 80 p 32] 9399

WHITE BOOK ON RESEARCH--In the future, French President Giscard d'Estaing will give the highest priority to research. This change in the research policy is based on the recently completed 500-page white book "Construire l'Avenir" ("Building the Future"), which was commissioned by the president a year ago. The white book accuses politicians of limiting vital research for industry through credit restrictions. Shortly after its publication, Pierre Augrain, secretary of state to the Ministry of Research, made the surprising announcement that his budget for 1981 had been increased by 17.7 percent to 30 billion francs. The government also decided that by 1988 expenditures for research be raised to 2.3 percent of the gross national product. This means that France would be spending approximately the same amount for science as Japan and the FRG are spending already today. The document was written by 17 "wise men," among them the sociologist Raymond Aron and the ethnologist Claude Levi-Strauss. The comprehensive analysis of the strengths and weaknesses of various scientific areas contains severe criticism of the research situation in the energy sector--which the government considers particularly important--calling conditions "catastrophic." The scientists are demanding a long-term commitment to the development of soft energy sources. Medium-range projects should concentrate on advanced nuclear reactors, in other words, fast breeders ("Superphenix"). [Text] [Frankfurt/Main FRANKFURTER ALLGEMEINE in German 12 Nov 80 p 13] 8991

CSO: 3102

LARGE-SCALE TEST BEGUN WITH PURE METHANOL VEHICLES

West Berlin DER TAGESSPIEGEL in German 31 Dec 80 p 7

> [Text] Two Mercedes 280 SE taxis, powered by pure methanol (methyl alcohol), have been running in Berlin for a week. Like the so-called M-15 large-scale test, in which 15 percent by volume of alcohol is added to the gasoline, the M-100 test will last 3 years and is being financed by the Ministry for Research. The plan is to have about 90 vehicles running on pure alcohol in the spring, among them commercial vehicles.

As has been reported in detail several times, the advantage of alcohol is not only its independence from oil. Methanol fuel can be obtained, for example, from natural gas, coal and the fermentation of other organic substances. The fuel is also of interest because of its lower production of toxic substances during combustion. Carbon monoxide is said to be reduced by 30 percent in a 15-percent mixture with gasoline, at M-100 it is eliminated completely.

The two M-100 taxis were converted a good deal more comprehensively for the new fuel than was necessary for the M-15 vehicles. Among the changes was fitting the vehicles with a much larger fuel tank, of 135 liters capacity. The reason is that the heat value of methanol is about one-half that of gasoline.

Besides the large sedans, a Rabbit GTI and commercial vehicles will also be used. About March the sanitation department will take delivery of its first diesel-alcohol trucks. It is not definite when the BVG [Berlin Transportation Company] will receive two prototypes it has ordered. Five refueling locations are planned for the vehicles, four of them at sanitation department plants and one on BVG property.

The M-15 test has already "run successfully" for the industry, according to information from the Society for the Study of Short Distance Transportation. It began about 1 year ago and is to be continued for 2 more years. About 900 vehicles are now on the highway in all parts of the FRG. As it turns out, these vehicles are no more prone to problems than their gasoline powered equivalents. It was possible to state this at this time, the report said, as 15 vehicles had already covered more than 100,000 kms. Fuel consumption is also no higher. In the case of an Audi 100 [5000] with a five-cylinder 115 hp engine, the average is said to be actually lower. All plastic parts in the M-15 vehicles coming into contact with the fuel had to be replaced with methanol resistant ones.

Since the drivers participating in the test are particularly interested from a technical point of view or the thrift-minded who want to enjoy the reimbursement for expenses, they maintain the required logbook extremely accurately. As the society said, the car owners made great efforts to obtain the special fuel only at the 11 Berlin gas stations. The reason, as one of the requirements stated, is that payments are radically reduced in the event of refueling too frequently at an "unauthorized" station, because this detracts from the purpose of the test.

There were problems for the taxi drivers, who have about 25 percent of the 600 vehicles in Berlin. They were frequently buying the fuel at a gas station in Halensee, which, in addition to its city location, has the advantage of being open round the clock. Sometimes it was no more than 2 days before the gas station's 13,000-liter tank was empty. The supply tank truck from Dortmund had not even completed its Berlin round before it was dispatched to the Halensee pump again. It had to pump out some of the special fuel from other, less frequented gas stations and bring it to the head of the Kurfuerstendamm. There are plans to provide the pump with a tank holding three times as much within a short time. Taxis use 40 percent of the special fuel in Berlin and 25 percent nationwide.

There have also been organizational problems in the supply of spare parts, when special M-15 parts were required. Since the vehicles were delivered in April in one consignment, they came in for service almost simultaneously at the approximately seven Berlin service shops which have been set up for the test vehicles. It could happen that a particular spare part was sold out at that moment. In the meantime, it was emphasized, restocking of spare parts is under way.

9581
CSO: 3102

TRANSPORTATION

BRIEFS

A300, A310 SALES--On 30 September Kuwait Airways and Airbus Industrie announced a contract for the purchase of five more A310's. The Kuwaiti airline had already ordered six A310's in June of this year. Kuwait Airways will fly the A310 on routes to Europe, the Middle East and the Far East. Just 1 day later Airbus Industrie was able to announce the sale of an additional A300B4-200. In this instance an option has been changed to a firm order from the Brazilian Cruzeiro do Sul. On 1 October 426 aircraft had been ordered by a total of 36 Airbus Industrie customers. There have been 282 orders (201 firm, 81 optional) for the A300 and a total of 144 orders (76 firm, 68 options) for the smaller A310. [Text] [Gelsenkirchen AEROKURIER in German Nov 80 p 1326] 9581

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